

# Device Modeling Report

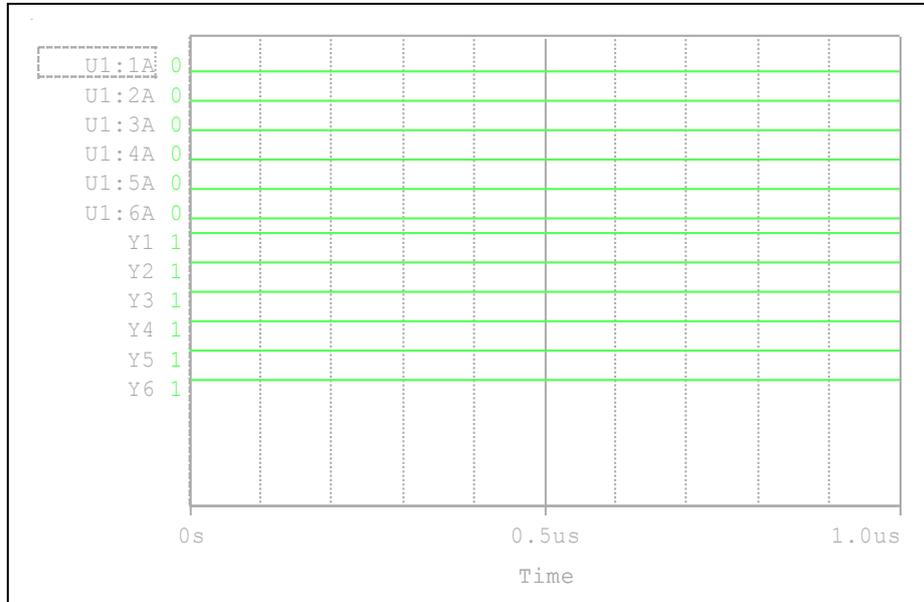
COMPONENTS : CMOS DIGITAL INTEGRATED CIRCUIT  
PART NUMBER : TC74HCT04AP  
MANUFACTURER : TOSHIBA



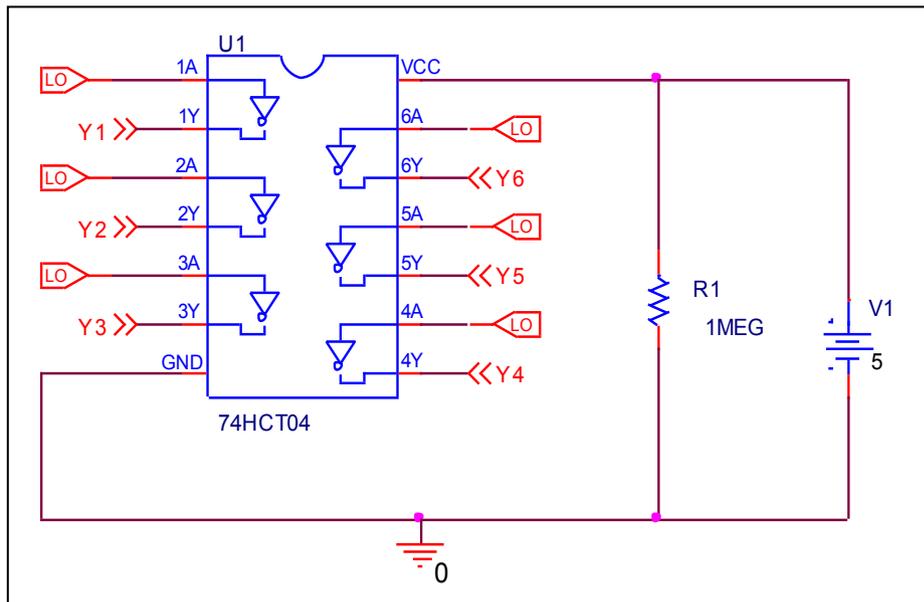
**Bee Technologies Inc.**

# Truth Table

## Circuit simulation result



## Evaluation circuit

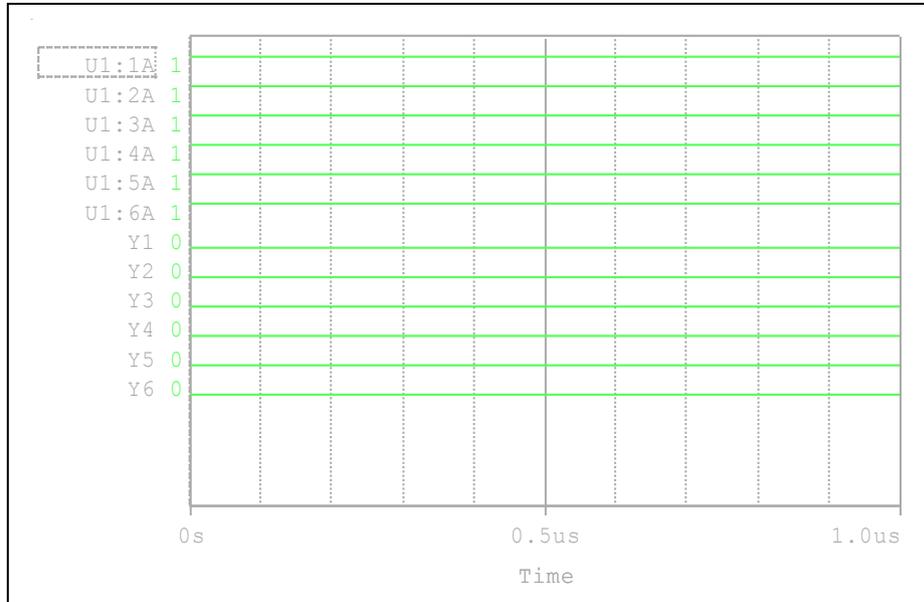


## Comparison table

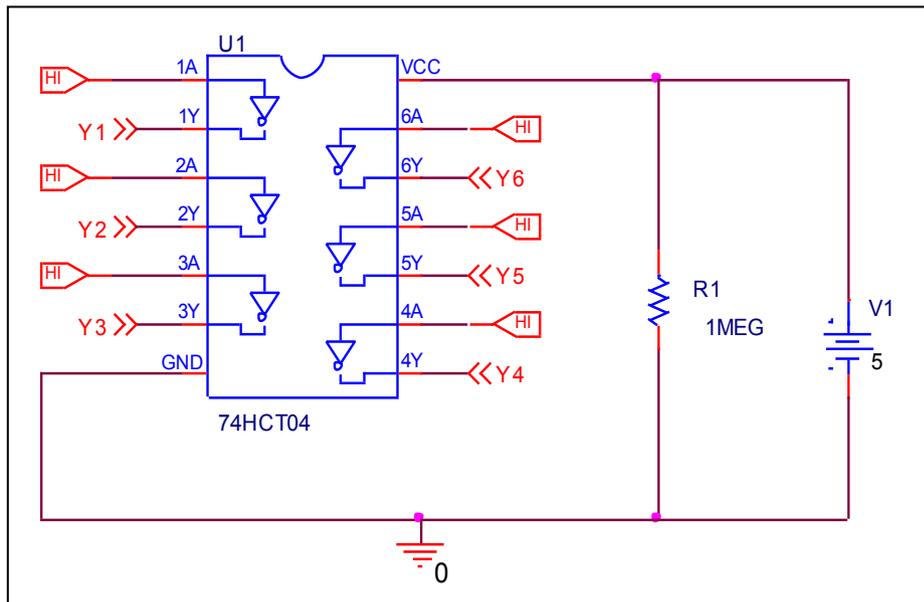
Input	Output		%Error
	Yn (Measurement)	Yn (Simulation)	
L	H	H	0

# Truth Table

## Circuit simulation result



## Evaluation circuit

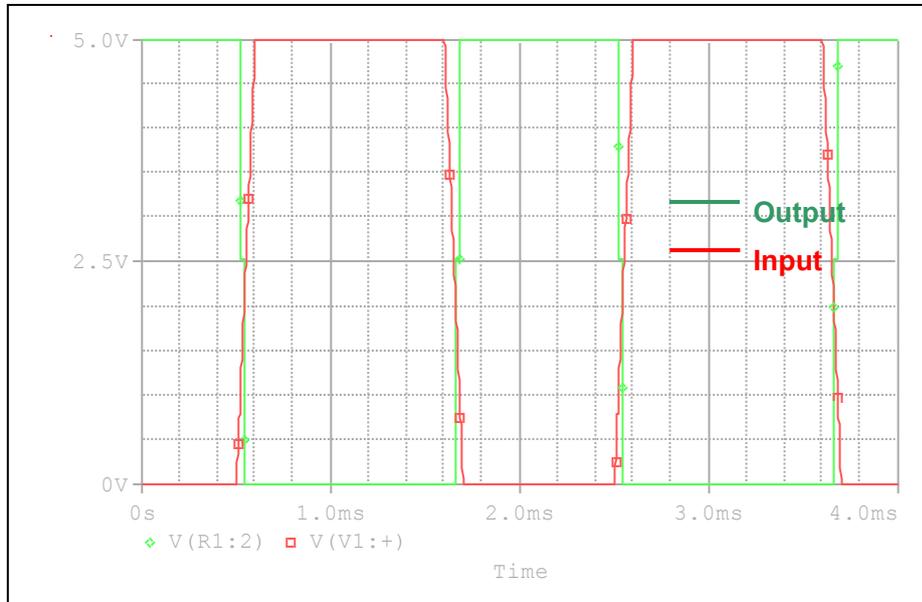


## Comparison table

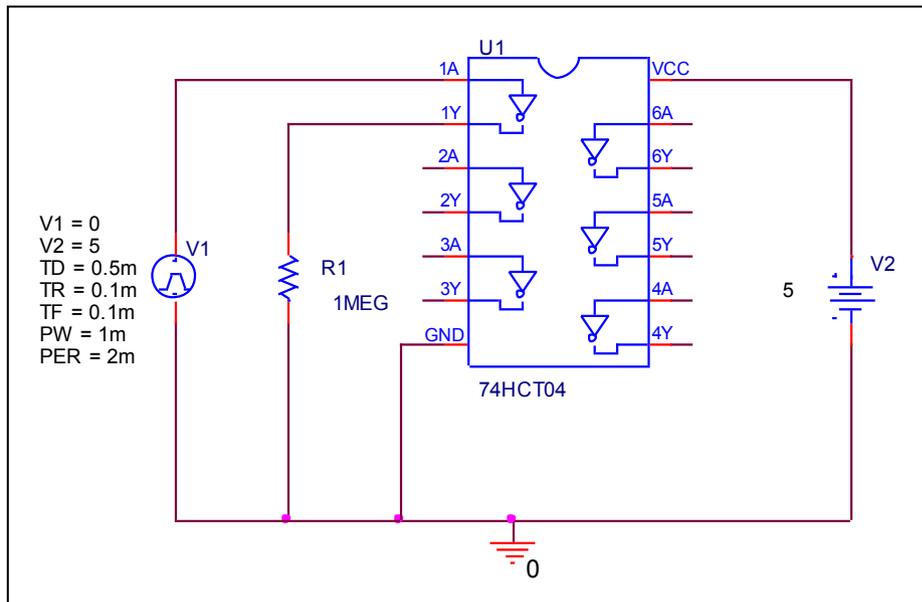
Input	Output		%Error
	Yn (Measurement)	Yn (Simulation)	
H	L	L	0

# High Level and Low Level Input Voltage

## Circuit simulation result



## Evaluation circuit

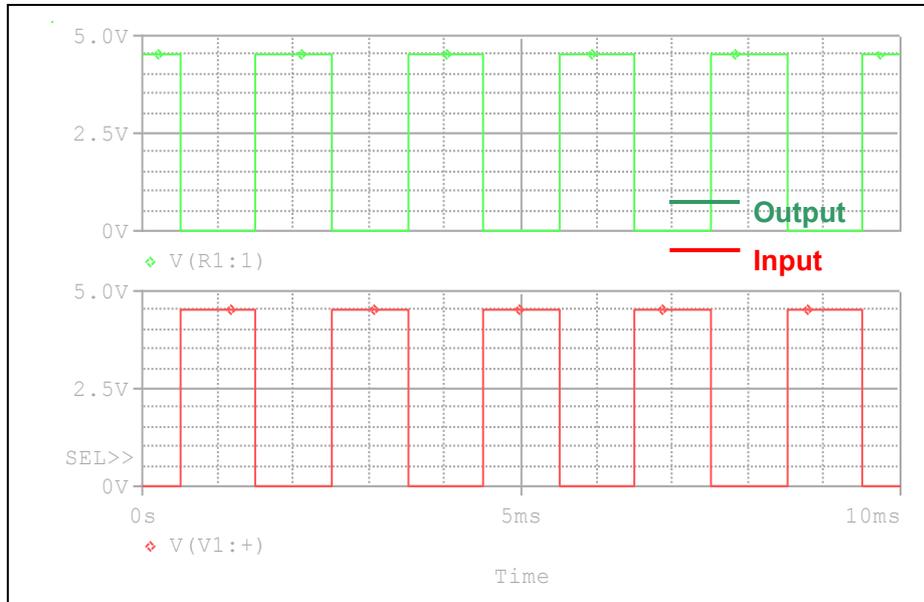


## Comparison table

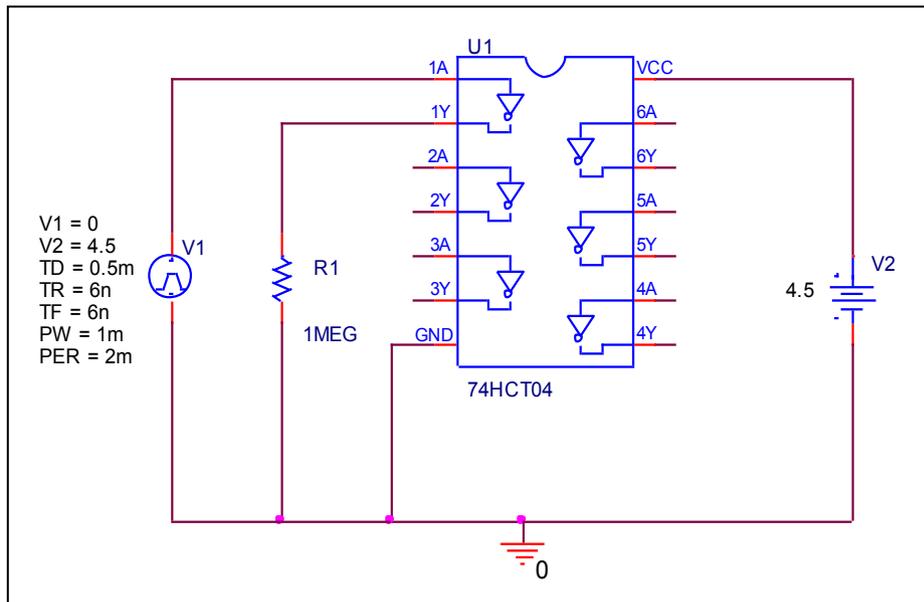
V <sub>CC</sub> = 5V	Measurement	Simulation	%Error
V <sub>IH</sub> (V)	2	2.0015	0.075
V <sub>IL</sub> (V)	0.8	0.799205	-0.099

# High Level and Low Level Output Voltage

## Circuit simulation result



## Evaluation circuit

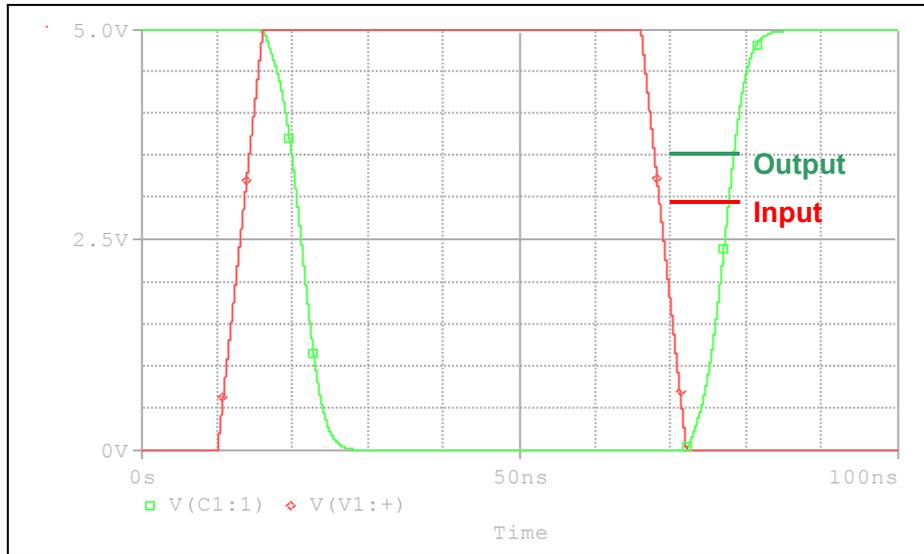


## Comparison table

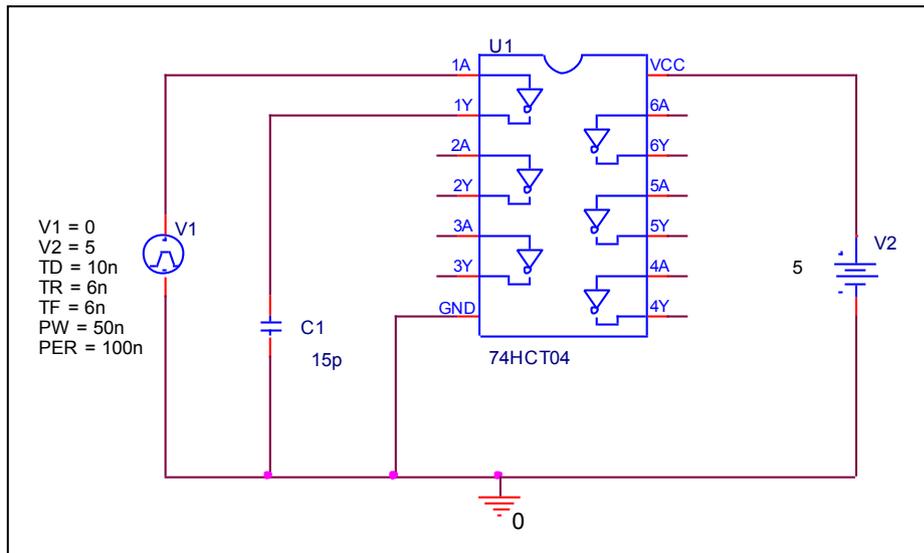
$V_{CC} = 4.5V$	Measurement	Simulation	%Error
$V_{OH} (V)$	4.5	4.4977	-0.051
$V_{OL} (V)$	0	0	0

# Propagation Delay Time

## Circuit simulation result



## Evaluation circuit



## Comparison table

$C_L=15pF, V_{CC} = 5V, tr=tf=6ns$	Measurement	Simulation	%Error
$t_{TLH}$ (ns)	6	6.0264	0.440
$t_{THL}$ (ns)	6	6.0130	0.217
$T_{pLH}$ (ns)	8	8.0715	0.894
$T_{pHL}$ (ns)	8	8.0700	0.875